

Avian Productivity in Tundra Riparian Shrub Habitats  
near Anaktuvuk Pass, Alaska

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## INTRODUCTION

Gates of the Arctic National Park and Preserve (GAAR) contains the northernmost breeding and nesting habitat for several neotropical migrant bird species. Survey data suggests that these and other migrant bird species in GAAR may be declining in North America. Shrub habitat in wet and riparian areas in the tundra allow some neotropical migrants to extend their range well beyond treeline. However, little information is available on songbird use of this habitat component of the tundra ecosystem. Changes in neotropical migrant songbird populations may be detected first at the northernmost limits of their breeding ranges. Therefore, information on nest density and species diversity in these habitat areas in GAAR should be collected and monitored. This information also will add to the park and preserve's baseline data for neotropical migrant bird populations, which is minimal.

The goal of this project is to evaluate the importance of riparian and shrub habitats in tundra ecosystems to neotropical migratory bird species. The objectives are:

1. To assess species diversity in different types of shrub habitat;
2. To determine nest densities for these areas; and
3. To describe nest site characteristics for all avian species encountered.

The study was supported by GAAR Resource Management base funds. The frustration of following speedy, flitting little brown birds to nest sites was made infinitely more tolerable by the dedicated field assistance of Donna DiFolco and Jim Lawler.

## STUDY AREA

Gates of the Arctic National Park and Preserve is located above the Arctic Circle in the Central Brooks Range, Alaska (Fig. 1). Study sites for this project were located in the northern part of the park and preserve, southwest of Anaktuvuk Pass (Fig. 1). The study area is within the Arctic climate zone which occurs on the north side of the Brooks Range. Annual precipitation is 13 - 25 cm in the area and mean annual snowfalls range between 89 and 127 cm (National Park Service 1986). Temperatures in the area fluctuate from an average July maximum of 18°C (65°F) to an average February minimum of -23°C (-10°F). Moist tundra is the predominant vegetation community on the north side of the Brooks Range. It is composed primarily of cotton sedge (*Eriophorum* spp.) and forms on moderate to poorly-drained soils. Low willow (*Salix* spp.) thickets line stream channels and low-lying areas in the northern tundra areas, but willow thickets up to 3 m tall occur along stream channels.

Two sites were selected for the first year of this study. Site 1 was located approximately 1.5 miles due west of Anaktuvuk Pass at the base of a rocky knoll (68°08' N Latitude, 151°48' W Longitude). Dominant cover types at the site were closed tall shrub and closed low shrub habitats comprised of flat-leafed willow (*Salix planifolia* subspecies *pulchra*). Water was running or ponded under the flat-leafed willow patches. Dwarf birch (*Betula nana*) scrub habitat occurred on well-drained areas. Other common plant species at this study site were: blueberry (*Vaccinium uliginosum*), lingonberry (*V. vitis-idaea*), labrador tea (*Ledum palustre*), *Sphagnum* spp., sedges (*Eriophorum vaginatum* and *Carex* spp.), and lichens (*Cetraria* spp. and *Cladina* spp.).

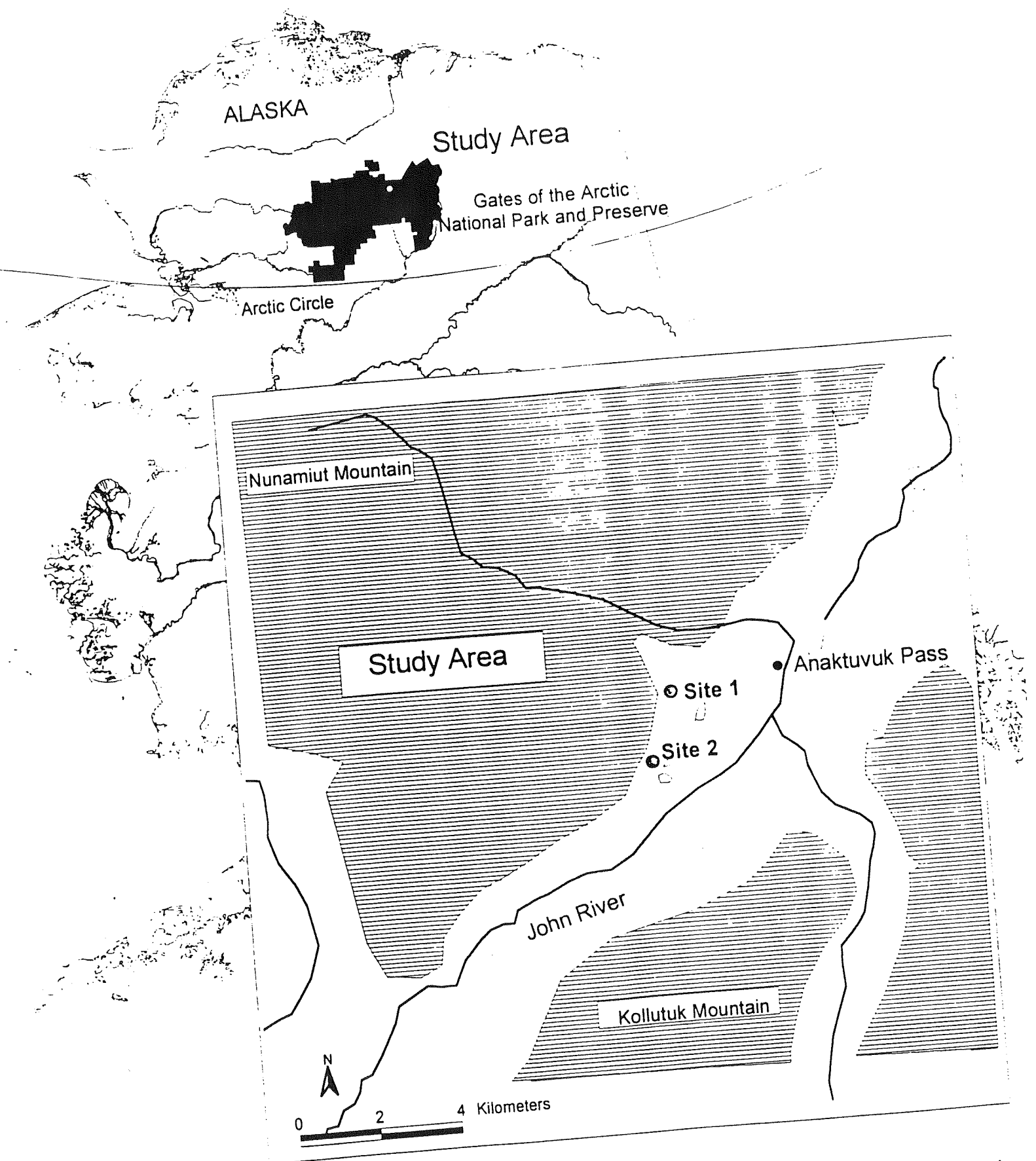


Fig. 1. Location of nest search sites near Anaktuvuk Pass, Gates of the Arctic National Park and Preserve, Alaska, June 1997.

The primary vegetation cover types at Site 2 were closed low shrub and ericaceous dwarf scrub. A small patch of closed tall shrub was located at the southwestern end of the site. Flat-leafed willow was the major shrub species, and tall willow shrubs were located around the ponded areas. Other plant species associated with this site were: dwarf birch (*Betula glandulosa* and *B. nana*), blueberry, lingonberry, Labrador tea, crowberry (*Empetrum nigrum*), *Carex* spp., *Sphagnum* spp., stairstep moss (*Hylocomium splendens*), mountain avens (*Dryas octopetala*), and dwarf willow (*Salix arctica*). Several seeps and numerous small ponds were found on this study site.

## METHODS

Methods used to locate nests followed those presented in Ralph et al. (1993). Two shrub habitat study sites were selected, and flagged transects were laid out through the middle of each site. Flagging facilitated nest relocation. Sketch maps of each site were made for pinpointing nest locations and habitat distribution (Appendix 1). Vegetation classification followed Viereck et al. 1992. Observers watched bird movements in the area to define territories and identify potential nest sites. Birds carrying nesting material, food, or being secretive were closely watched to determine nest location. Bird activity appeared to slow down considerably around 1400 h, and we discontinued nest searching after that time. Best search times appeared to be between 0600 h and 1300 h.

When a potential nest area was identified, observers carefully walked through the area trying to spot the nest. Adult birds sometimes gave alarm calls or exhibited "broken-wing/dying adult" distraction behavior when observers were near the nest site. When a nest was located, photos were taken to document the nest site, construction, concealment, number of nestlings/eggs, and nest material. A nest density data sheet (Appendix II) was filled out for each nest. Observer time at the nest site was minimized to prevent excessively stressing the parent birds and nestlings or alerting predators to the nest location.

In addition to the above technique for locating nests, observers carefully walked through the shrubs at Site 1 three abreast, trying to flush birds off nests and locate suspected nests. This method also was used to locate tundra nesting species on two 50 m x 50 m grids in tundra habitat adjacent to Site 1; 3 observers, 2 m apart, traversed the grid from one side to the other until the entire grid area had been covered.

## RESULTS

During the study, nests or fledglings for the following 5 bird species were located on the study sites: savannah sparrow (*Passerculus sandwichensis*), American tree sparrow (*Spizella arborea*), white-crowned sparrow (*Zonotrichia leucophrys*), common redpoll (*Carduelis flammea*), and short-eared owl (*Asio flammeus*) (Table 1). Young or nests of an additional 4 bird species were found in areas outside the study sites: northern shrike (*Lanius excubitor*), lapland longspur (*Calcarius lapponicus*), northern wheatear (*Oenanthe oenanthe*), and American robin (*Turdus migratorius*).

Four nests were found on Site 1 in 19 hours of searching (0.21 nests/hr); hours of searching is the sum total of the number of hours each observer spent actively searching for nests on the site. Five nests were found in 15.75 hours of searching on Site 2 (0.32 nests/hr). Only one nest was located during the 2 tundra surveys; this nest was one of two known nests to be in the study plot. Observers may need to walk closer together or drag ropes between them to flush birds off nests in this habitat type since the birds appear very reluctant to leave their nests.

Teacup-shaped ground nests were found for white-crowned sparrows, American tree sparrows, and savannah sparrows. White-crowned sparrow nests were found on the ground under tall willow shrubs. This species was quick to give alarm calls when observers approached the nest site. White-crowned sparrow offspring ranged from the egg stage to fully-feathered young having recently left the nest (referred to as a fledgling in this report though it was only seen running around on the ground). Contrary to American tree sparrows and savannah sparrows, white-crowned sparrows were not actively singing from perches and were secretive in behavior. However, pairs with fledglings sang more often than those on nests with eggs or nestlings.

American tree sparrows were singing frequently and actively chasing each other at Site 1. Despite all the activity in the shrubs, the only American tree sparrow nest found on Site 1 was located in open tundra 10 m from the edge of the shrubs. The nest was built into a cotton sedge tussock and was found incidentally while walking along the outer perimeter of the study site. The adult flushed off the nest, flew directly to nearby shrubs and began alarm calling. The American tree sparrow nest at Site 2 was built into a sphagnum hummock covered with sparse willow shrubs 35 cm tall. Both of these nests contained nestlings as did a third nest found outside the study sites. The nest at Site 2 was located by following an adult carrying a large insect in its bill and seeing a food exchange.

The savannah sparrow nest was located while walking through the tundra adjacent to Site 1. The female shot out of the nest and began feigning a broken back while moving away from the nest. This display was not repeated on another occasion when we purposefully walked transects to flush nesting birds in the same area, though an adult did flush directly off the nest. The nest was hollowed into a tussock/moss hummock and had a short tunnel entrance into the nest chamber. Both savannah and American tree sparrows used shrubs to perch and sing but appeared to nest in the open tundra habitat.

The common redpoll nest was being constructed in a flat-leaved willow shrub. A weaving of coarse twigs was in place and the female appeared to be collecting very fine lining material from cotton sedge and possibly spider web. The adults were very agitated as we examined the nest structure and then commenced foraging activities.

The short-eared owl nest was located when the adult flushed while the observer was in the vicinity following a savannah sparrow. The nest consisted of a scrape in the center of a prostrate shrub birch, 1.5 m in diameter. The nest contained 3 eggs and 2 newly hatched young; the nestlings held perfectly still while we were at the nest site. Four microtines were stacked on the edge of the nest. On the second day, the adult flushed from the nest just after we crested the hill near the

study site. Given the cool weather and the unprotected chicks, we decided to discontinue work at that site.

Nest density appeared to be a function of shrub patch size and distribution rather than food abundance or territory size. On Site 1, nests of different species appeared to be closer together than nests of the same species, possibly demonstrating intraspecific (but not interspecific) competition. For instance, savannah, white-crowned, and American tree sparrow nests (1 nest per species) were located within 30 m of each other, but the white crowned sparrow nest was 94 m from the other white-crowned sparrow nest on the site. Shrub habitat was fairly continuous at Site 1, but was patchy and more dispersed at Site 2. Consequently, nests at Site 2 were more dispersed, being a minimum of 66 m apart. Large patches of ericaceous dwarf scrub separated the taller shrub habitat clumps at Site 2 and appeared to serve as boundaries; one nest was located in each of the taller shrub areas.

Detailed nest descriptions are located in Appendix III.

## DISCUSSION

Every year, millions of migratory birds return to GAAR to nest and rear their young. Nesting habits and habitat use for many of these bird species is minimally documented. Nest search and monitoring techniques can provide direct measures of habitat use by nesting birds and nest success. These techniques, described by Ralph et al. (1993), require plots of 40–50 ha and routine monitoring every 3–4 days throughout the nesting phase. In this pilot project, we wanted to determine the feasibility of locating nests in tundra riparian shrub areas and assess nest density in these areas by species. We did not attempt to monitor nest success over time.

White-crowned sparrows were easiest to detect because they were usually in tall shrubs and gave alarm cries when observers were near nest sites. Savannah sparrows and American tree sparrows appeared to use riparian shrubs primarily as singing perches and nested in the tundra, making nest location challenging. These species spent much of their time in the shrubs chasing their conspecifics around, leading one to believe that they were defending territories and nests. No American tree sparrow nests were found in the shrubs at Site 1 where extensive chase flights between approximately 6 individuals occurred; the only nest found for this species at Site 1 was in the tussock tundra 10 m east of the shrubs. It was also difficult to keep track of birds (particularly savannah sparrows and American tree sparrows) during foraging flights out into the tundra; birds could have been collecting food and feeding young on the tundra before returning to the shrubs to sing or they could have been sneaking into the shrubs, feeding the young, and then popping up to sing.

Nest searching requires much observer time and patience. Nest stage (construction, brooding, nestling, and fledged) and consequent species behaviors during each stage are significant factors in nest location success. During this study, nests were at all different stages of use and development, and adult behaviors differed accordingly. At Site 2, one pair of white-crowned sparrows had fledglings and were singing loudly and frequently, while another pair had 1 egg and 2 recently hatched young in the nest and were not singing at all. Because of the varied adult activity levels at the different nest stages, the probability of successfully detecting nests or identifying nest areas differs greatly. Detection

rate variability is frequently a problem with census techniques. The potentially high level of detection variability associated with the survey technique (as conducted in this study) makes it difficult to obtain an accurate nest density estimate.

#### MANAGEMENT RECOMMENDATIONS

- Nest searches should begin in early June in the Anaktuvuk area. Nests should be located during the construction stage to provide the best estimates of nest success (Ralph et al 1993). The high level of bird activity associated with nest building makes it the easiest time to find nests, particularly prior to leaf out. Nests (except the redpoll nest) were well beyond the construction phase when this study occurred in late June; the redpoll nest may have been a renest or second clutch effort.
- Shrub patchiness and its impact on nest distribution makes an abundance estimate difficult and likely inaccurate, particularly when extrapolating to a larger area. Large blocks of uniform habitat should be studied to obtain more reliable estimates.
- Search areas should be larger than the 8-10 ha plots used in this study, particularly since nest densities appear to be low; search plots should be 40-50 ha or large enough to locate 20 nests per species for the range of species found in that habitat type (Ralph et al 1993). Sufficiently large shrub areas are found on the Noatak River. I recommend initiating a nest search study in this area to see if detection rates and nest densities are adequate to obtain accurate nest density estimates.
- Birds nesting in tundra and dwarf scrub habitats are challenging to study using nest search techniques. Bird abundance was low in these habitats, and birds on nests were difficult to flush. Tundra nesting sparrows often stayed on their nests until they were in physical danger of being stepped on; methods other than those tested in this study (such as dragging ropes) may be necessary to successfully locate and monitor nests for these birds.
- Nest predation is a common problem with nest search techniques. Guidelines for minimizing the risk to nests being monitored as presented in Ralph et al (1993) should be incorporated into the study methods.
- Obtaining nest success information is labor intensive. Nests would have to be monitored every 3-5 days in June and early July. The data could be contributed to the Breeding Biology Research Database or the Nest Record Programs (Finch and Stangel 1993; p. 196). This would be an appropriate project for NRPP funds or other outside funding sources. Such intensive monitoring is probably not warranted at this time using park base funds.

Table 1. Nests detected in 2 riparian areas in tundra habitat near Anaktuvuk Pass, Gates of the Arctic National Park and Preserve, Brooks Range, Alaska, 21-23 June 1997.

Species Name	Nest Status	Number of eggs	Number of young
Site 1			
American tree sparrow	Active		4 nestlings
White-crowned sparrow	Active	5 eggs	
White-crowned sparrow	Active		3 nestlings
Savannah sparrow	Active	1 egg	3 nestlings
Site 2			
American tree sparrow	Active		4 nestlings
White-crowned sparrow	Active	1 egg	2 nestlings
White-crowned sparrow	Inactive: fledged		1 fledgling
Common redpoll	Construction		
Short-eared owl	Active	3 eggs	2 nestlings



## LITERATURE CITED

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- Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin, D.F. DeSante. 1993. Handbook of field methods for monitoring landbirds. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Dept. of Agric. 41 pp.

Appendix I. Sketch maps of vegetation and nest locations for Site 1 and Site 2 of the Anaktuvuk Pass nest density study, Gates of the Arctic National Park and Preserve, Brooks Range, Alaska, June 1997.

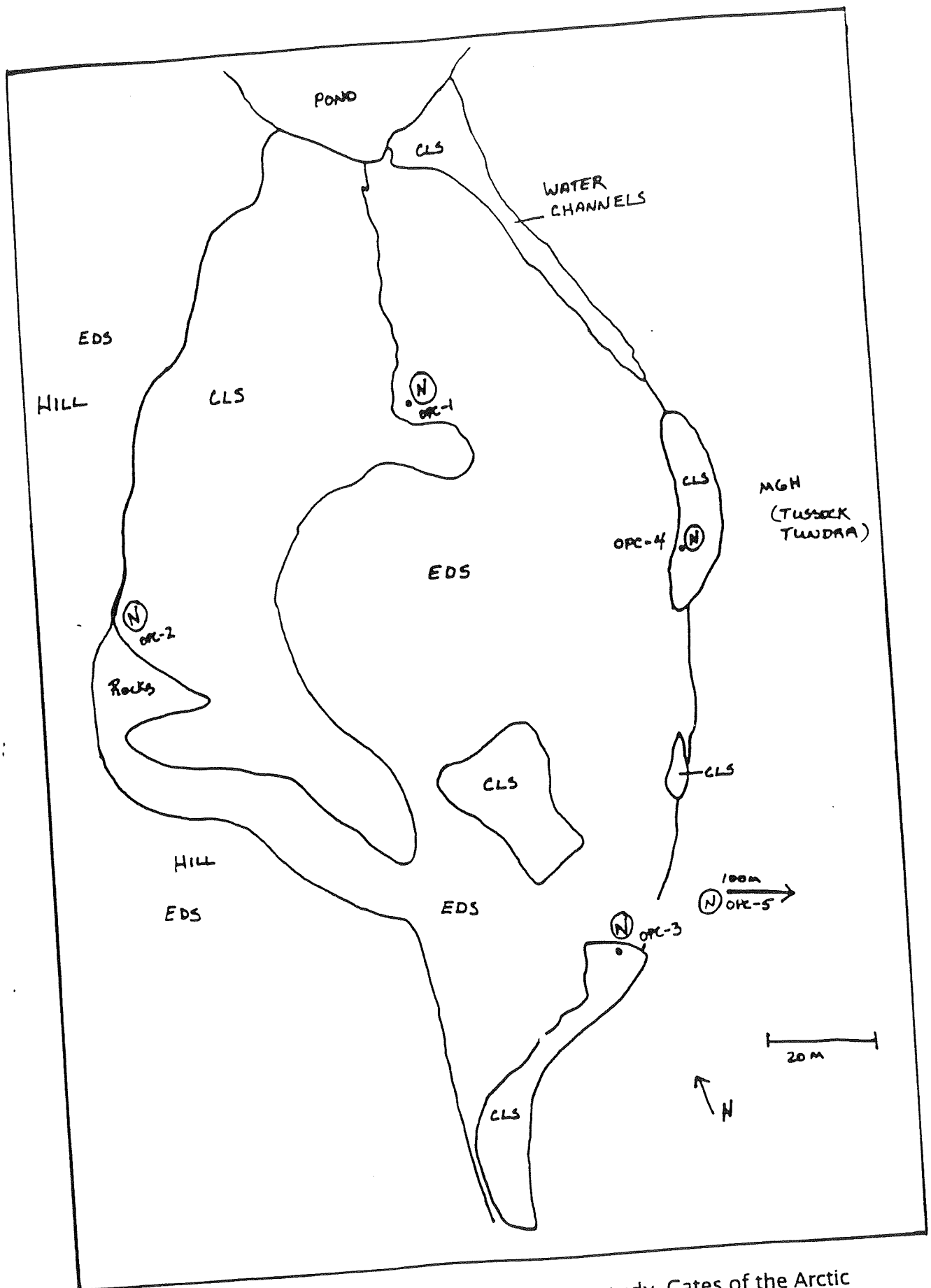


Fig. 1A. Sketch map for Site 1 of the nest density study, Gates of the Arctic National Park and Preserve, Brooks Range, Alaska, June 1997. Nest locations are denoted by 'N' and labeled with the nest identification number (OPC-xx). Vegetation Codes are as follows: CLS—closed low shrub, EDS—ericaceous dwarf shrub, and MGH—mesic graminoid herbaceous.

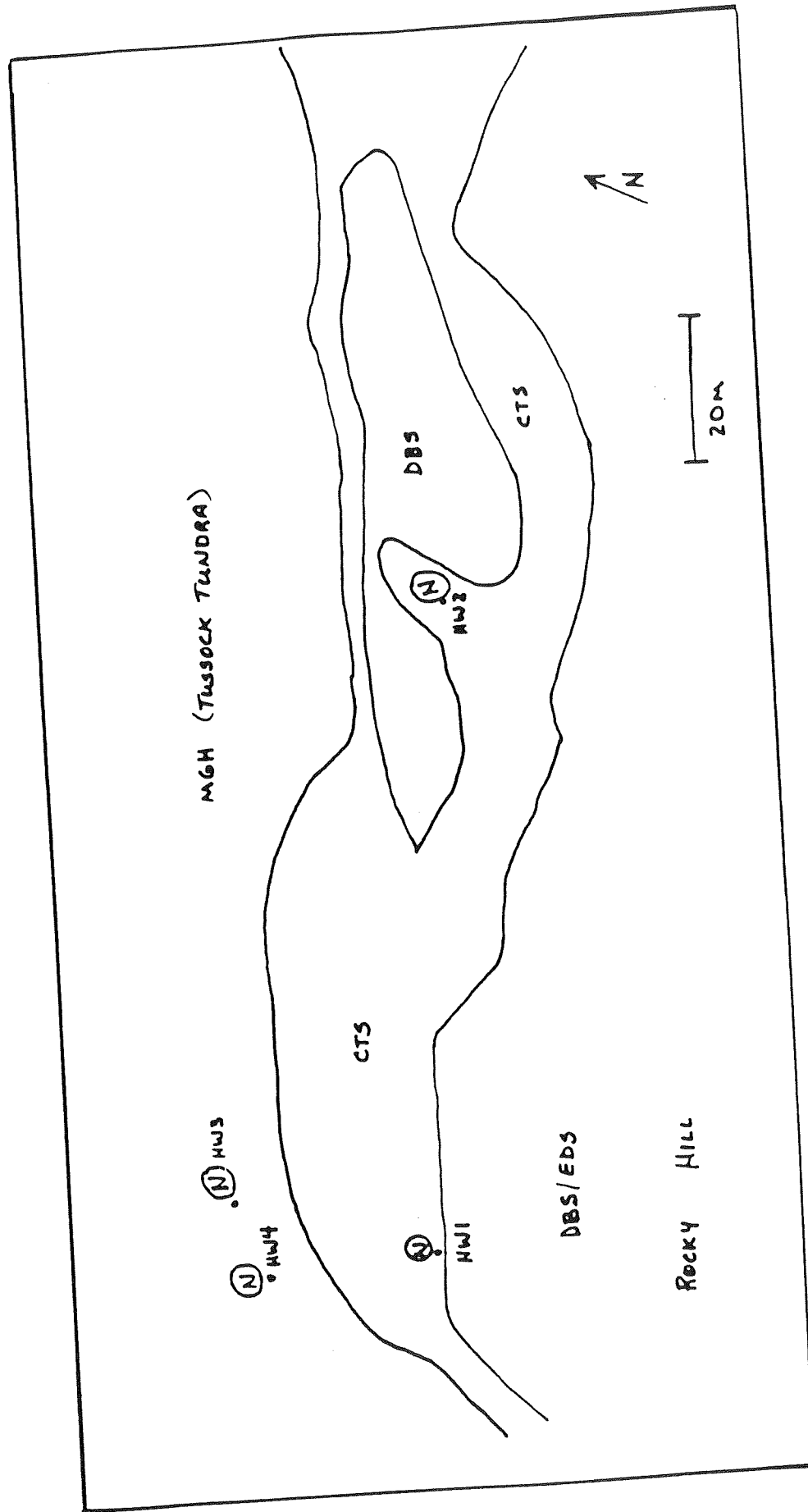


Fig. 1B. Sketch map of Site 2 of the nest density study, Gates of the Arctic National Park and Preserve, Brooks Range, Alaska, June 1997. Nest locations are marked 'N' and labeled with the nest identification number (HW-xx). Vegetation classification codes are: CTS—closed tall shrub, DBS—dwarf birch shrub, EDS—ericaceous dwarf scrub, and MGH—mesic graminoid herbaceous.

Appendix II. Data sheet used to collect nest information during a nest search study near Anaktuvuk Pass, Gates of the Arctic National Park and Preserve, Brooks Range, Alaska, 1997.

NEST DENSITY STUDY DATA SHEET

Nest ID: \_\_\_\_\_

Observer: \_\_\_\_\_

Species: \_\_\_\_\_

Date: \_\_\_\_\_

Nest stage: Construction   Egg laying   Incubation   Nestlings   Fledged/Failed

# Eggs \_\_\_\_\_ # Nestlings \_\_\_\_\_

Nest Site Description:

Vegetation Type: \_\_\_\_\_

Nest Shrub type: \_\_\_\_\_ Shrub height (m): \_\_\_\_\_

Associated vegetation within 5 m: \_\_\_\_\_

Nest height above ground: \_\_\_\_\_

Nest distance from center stem: \_\_\_\_\_

Diam. support branches: \_\_\_\_\_ # support branches: \_\_\_\_\_

Nest concealment (% cover in a 25cm circle at 1m from nest):

above \_\_\_\_\_ below \_\_\_\_\_ N \_\_\_\_\_ S \_\_\_\_\_ E \_\_\_\_\_ W \_\_\_\_\_

Aspect: \_\_\_\_\_

Nest Description/Material: \_\_\_\_\_

Nest Location Description: \_\_\_\_\_

Appendix III. Detailed descriptions of nests located during the nest search pilot study in two riparian habitat areas near Anaktuvuk Pass, Gates of the Arctic National Park and Preserve, Brooks Range, Alaska, June 1997.

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SITE 1

Species: White crowned Sparrow  
Date: 21 June 1997  
Nest Stage: Incubation

Nest Identification Number: HW1

Number Eggs: 5    Number Nestlings: 0

Primary nest site vegetation type: *Salix planifolia*  
Associated vegetation within 5 m: *Betula nana*, *Lycopodium* spp., *Equisetum* spp.

Nest height above ground: flush  
Diameter of support branches: N/A

Distance from center stem: 60 cm  
Number of support branches: N/A

Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
above: 20    below: 100    N: 20    S: 100    E: 20    W: 30

Aspect: N/A

Nest Description/Material: Tea cup nest of dried grass/sedge lining the nest. Prostrate branch growing nearby and partially over the nest. Eggs were bluish with lots of brown speckling.

Nest Location Description: Nest was located in the shrub thicket, approximately 30 cm from the edge. It was approximately 2 m from a large rock covered with lichens. Between first 2 flags.

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Species: White crowned Sparrow  
Date: 21 June 1997  
Nest Stage: Nestlings

Nest Identification Number: HW2

Number Eggs: 0    Number Nestlings: 3

Primary nest site vegetation type: *Salix planifolia*  
Associated vegetation within 5 m: *Betula glandulosa*, *Equisetum* spp., *Vaccinium uliginosum*

Nest height above ground: flush  
Diameter of support branches: N/A

Distance from center stem: N/A  
Number of support branches: N/A

Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
above: 50    below: 100    N: 30    S: 100    E: 90    W: 100

Aspect: N

Nest Description/Material: Tea cup nest with dried grass/sedge lining the nest. Located between several stems of *B. glandulosa* and *S. planifolia*. Nestlings were featherless.

Nest Location Description: Nest was in a small patch of willow shrubs in the center of the site.

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Species: American Tree Sparrow      Nest Identification Number: HW3  
Date: 21 June 1997  
Nest Stage: Nestlings      Number Eggs: 0      Number Nestlings: 4

Primary nest site vegetation type: *Eriophorum vaginatum* tussock  
Associated vegetation within 5 m: *Betula glandulosa*, *Empetrum nigrum*,  
*Sphagnum* spp., *Salix planifolia*, and *Vaccinium vitis-idaea*.

Nest height above ground: flush      Distance from center stem: 6 cm  
Diameter of support branches: N/A      Number of support branches: N/A  
Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
above: 75    below: 100    N: 100    S: 100    E: 20    W: 100  
Aspect: SE

Nest Description/Material: Tea-cup nest lined with feathers. Dried grass on the outside. Built into a tussock; tussock overhangs the nest opening.

Nest Location Description: In tundra 10 m from the north edge of the shrubs.

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Species: Savannah Sparrow      Nest Identification Number: HW4  
Date: 22 June 1997  
Nest Stage: incubation/nestlings      Number Eggs: 1      Number Nestlings: 3

Primary nest site vegetation type: *Eriophorum vaginatum* (open dwarf scrub)  
Associated vegetation within 5 m: *Betula glandulosa*, *Vaccinium uliginosum*,  
*Sphagnum* spp., *Eriophorum vaginatum*, *Carex* spp., *Salix planifolia*, and *Ledum groenlandicum*.

Nest height above ground: 0      Distance from center stem: shaded by small *B. glandulosa*

Diameter of support branches: N/A      Number of support branches: N/A  
Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
above: 100    below: 100    N: 100    S: 30    E: 100    W: 100  
Aspect: SE

Nest Description/Material: Burrow-like nest made of dried grass. Nest was sunk into a tussock/sphagnum hummock and had a short tunnel entrance. Nestlings were dark black and fuzzy. Adult feigned a broken back/wing performance for until she reached the edge of the shrubs 15 m away. Here she flew into the shrubs and continued to alarm call.

Nest Location Description: In tundra, 15 m from the edge of closed low shrub at the west end of the grid.

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## Site 2

Species: American Tree Sparrow      Nest Identification Number: OPC-1  
Date: 22 June 1997  
Nest Stage: Nestlings      Number Eggs: 0      Number Nestlings: 3

Primary nest site vegetation type: *Sphagnum* spp. (open low shrub)  
Associated vegetation within 5 m: *Betula glandulosa*, *Vaccinium uliginosum*, *Salix planifolia*, and *Hylacomium splendens*.

Nest height above ground: flush      Distance from center stem: N/A  
Diameter of support branches: N/A      Number of support branches: N/A  
Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
    above: 100      below: 100      N: 95      S: 80      E: 10      W: 100  
Aspect: E

Nest Description/Material: Cup-shaped nest made of moss and grass, lined with feathers. Nestlings were developing feathers—beyond the fuzzy stage. Nest was discovered by tracking an adult with food in its mouth until it went to the nest.

Nest Location Description: Located in a sphagnum hummock in ponded water area.

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Species: White-crowned Sparrow      Nest Identification Number: OPC-2  
Date: 22 June 1997  
Nest Stage: Fledgling      Number Fledglings: 1

Primary nest site vegetation type: *Salix planifolia* (Tall closed scrub)  
Associated vegetation within 5 m: *Betula glandulosa*, *Carex* spp., *Valeriana capitata*, and *Empetrum nigrum*.

Nest height above ground: N/A      Distance from center stem: N/A  
Diameter of support branches: N/A      Number of support branches: N/A  
Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
    above: N/A      below: N/A      N: N/A      S: N/A      E: N/A      W: N/A  
Aspect: NA

Nest Description/Material: Nest was not located. Fledgling scurried around in the underbrush and stuck close to the shrub area. Saw several food exchanges on the ground. Adults were alarm calling whenever someone was in the area.

Nest Location Description: Tall shrubs near hillside at northeastern edge of study site. Male was singing in the tallest shrub.

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Species: Common Redpoll  
Date: 22 June 1997  
Nest Stage: Construction

Nest Identification Number: OPC-3

Number Eggs: 0    Number Nestlings: 0

Primary nest site vegetation type: *Salix planifolia* (closed low scrub)  
Associated vegetation within 5 m: *Empetrum Nigrum*, *Betula glandulosa*,  
*Vaccinium uliginosum*, *Carex* spp., and other ericaceous low shrubs. These  
plants were all under tall willow shrubs.

Nest height above ground: 50 cm    Distance from center stem: 10 cm  
Diameter of support branches: 1-2 cm    Number of support branches: 6  
Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
above: 60    below: 50    N: 40    S: 45    E: 70    W: 5  
Aspect: W

Nest Description/Material: Cup-shaped nest composed of lichen, small twigs  
and dried crowberry stems. Lined with small amount of willow fuzz or spider web  
material. Observed female later collecting *Eriophorum* spp. seed fuzz. Were  
quite anxious to return to nest

Nest Location Description: In *Salix planifolia* patch at southeast end of study  
site.

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Species: White-crowned Sparrow  
Date: 22 June 1997  
Nest Stage: Incubation/nestlings

Nest Identification Number: OPC-4

Number of Eggs: 1    Number Nestlings: 2

Primary nest site vegetation type: *Salix planifolia* (closed low shrub)  
Associated vegetation within 5 m: *Betula glandulosa*, *Ledum groenlandicum*,  
*Lycopodium* spp., *Polygon bistorta*, *Carex* spp., *Empetrum nigrum*, and *Vaccinium*  
*uliginosum*.

Nest height above ground: flush    Distance from center stem: 10 cm  
Diameter of support branches: N/A    Number of support branches: N/A  
Nest concealment (% cover in a 25 cm circle at 1 m from nest):  
above: 90    below: 100    N: 90    S: 70    E: 60    W: 70  
Aspect: NW

Nest Description/Material: Teacup nest hollowed out in sphagnum moss and  
lined with dried grasses.

Nest Location Description: Near edge of tall stand of *S. planifolia* near ponded  
water area. Nest on small ridge at southwest edge of ponded water.

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Species: Short-eared Owl

Nest Identification Number: OPC-5

Date: 22 June 1997

Nest Stage: Incubation/nestlings

Number Eggs: 3

Number Nestlings: 2

Primary nest site vegetation type: *Betula glandulosa* (mesic graminoid herbaceous)

Associated vegetation within 5 m: *Salix reticulata*, *Betula glandulosa*, *Eriophorum vaginatum*, *Carex* spp., *Vaccinium uliginosum*, *V. vitis-idaea*, *Empetrum nigrum*, *Ledum groenlandicum*, and lichen spp.

Nest height above ground: scrape-flush

Distance from center stem: N/A

Diameter of support branches: N/A

Number of support branches: N/A

Nest concealment (% cover in a 25 cm circle at 1 m from nest):

above: 0    below: 100    N: 35    S: 10    E: 10    W: 35

Aspect: SE

Nest Description/Material: Nest was a scraped out area with small amounts of grass on the otherwise bare ground. Only a few feathers were present. 3 voles were stockpiled around the nest edge. Nest was in a clump of *Betula glandulosa* in the midst of tussock tundra adjacent to study site.

Nest Location Description: 100 m southeast of point 3 on the Anaktuvuk Off-road Point Count route.

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